NASA SBIR 2006 Phase I Solicitation

S8.03 On-Board Science for Decisions and Actions

Lead Center: ARC

The focus of this subtopic is enhanced capabilities for NASA observatories in the sensor or platform, or early in the data stream, that can prioritize data for transmission and analysis, or summarize the data for future use. NASA's vision of a sensor-web capability will demand more onboard autonomy and content based data management to support rapid decision making and re-tasking. This subtopic is interested in methods to autonomously understand data as part of a sensor web system capable of rapid redirection and configuration.

Onboard Satellite Data Processing and Intelligent Sensor Control

Software technologies that support the configuration of sensors, satellites, and sensor webs of space-based resources. Examples include capabilities that allow the reconfiguration or re-targeting of sensors in response to user demand or in significant events seen in other sensors. Included are software that supports the reasoning and modeling of such capabilities for demonstration and mission simulation. Also included in this category is onboard analysis of sensor data that could run on reconfigurable computing environments as well as technologies that support or enable the generation of data products for direct distribution to users.

Onboard Satellite Data Organization, Analysis, and Storage

Software technologies that support the storage, handling, analysis, and interpretation of data. Examples include innovations in the enhancement, classification, or feature extraction processes. Also included are data mining, intelligent agent applications for tracking data, distributed heterogeneous frameworks (including open system interfaces and protocols), and data and/or metadata structures to support autonomous data handling, as well as compaction (lossless) or compression of data for storage and transmission.

Simulation and Analysis of Sensor Webs for Improving Science Models or Mission Operations

Software that allows for the simulation of a sensor web of varying platform types producing a variety of data streams. These platforms could be in various orbits (L1, L2, NEO, LEO, etc.) and suborbital (UAV) that are automatically assigned different temporal and spatial coverages. Data streams would be assigned to these platforms and the system computes how the sensor web would cover of events (e.g., volcanic eruption, fires, and crop monitoring) at user designated, particular, geospatial locations (or areas).